Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently Amended) ~~In~~ Apparatus for a radio communication system having a first communication station ~~and a second communication station between~~ with which data is communicated, data communication ~~by the second communication station~~ to the first communication station effectuated upon a first channel and data communication by the first communication station ~~to the second communication station~~ effectuated upon a second channel, the first communication station having an antenna array capable of forming an adaptively-selectable antenna pattern configuration, ~~an improvement of~~ said apparatus for selecting the antenna pattern configuration formed by the antenna array responsive to indications of data communicated ~~by the second communication station~~ to the first communication station, said apparatus comprising:

a first channel correlation matrix generator adapted to receive the indications of the data communicated to the first communication station, said first channel correlation matrix for generating a first-channel correlation matrix, the first-channel correlation matrix defined in terms of first Fourier series coefficients of first values;

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a reformulator coupled to receive the indications of the ~~data~~

~~communicated by the second communication station to the first communication station~~

first-channel correlation matrix generated by said first-channel correlation matrix

generator, said reformulator for reformulating the indications into a vector representation

of the ~~indications~~ first-channel correlation matrix, the vector representation including a

coefficient vector;

a coefficient-vector calculator operable responsive to formation of

the vector representation by said reformulator, said coefficient-vector calculator for

calculating values of the coefficient vector forming a portion of the vector representation

formed by said reformulator;

a second-channel, channel characteristic calculator coupled to

receive indications of the values of the coefficient vector formed by said coefficient-

vector calculator, said second-channel channel characteristic calculator for calculating

indications of characteristics of the second channel, the indications of the characteristics

of the second channel, also defined in terms of the first Fourier series coefficients at the

first values, used to select the antenna pattern configuration.

2.   (Currently Amended) The apparatus of claim 1 wherein the radio

communication system comprises a frequency division duplex (FDD) system, wherein

the first channel is defined about a first frequency and the second channel is defined

about a second frequency, and wherein the indications of the data responsive to which

said ~~reformulator forms the vector representation comprises indications of channel~~

~~characteristics of the first channel~~ first-channel correlation matrix generates the first-

channel correlation matrix.

3.-4.   (Cancelled)

5.   (Currently Amended) The apparatus of claim ~~3~~ 1 wherein said

reformulator reformulates the first-channel, channel correlation matrix into a single-

column matrix, the single-column matrix forming the coefficient vector.

6.   (Original) The apparatus of claim 1 wherein said coefficient vector

calculator calculates optimal values, according to a selected optimization scheme, of the

coefficient vector.

7.   (Original) The apparatus of claim 6 wherein the optimization scheme

comprises a minimization scheme.

8.   (Original) The apparatus of claim 3 wherein the indications of the

characteristics of the second channel formed by said second-channel, channel

characteristic calculator comprise a second-channel correlation matrix.

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9.   (Original) The apparatus of claim 8 further comprising an antenna

pattern configuration selector coupled to said second-channel, channel characteristic

calculator, said antenna configuration selector for selecting, responsive to the indications

of the characteristics of the second channel calculated by said second-channel

characteristic calculator, the antenna pattern.

10.   (Original) The apparatus of claim 9 wherein the antenna array

comprises a plurality of antenna devices, each antenna device having a selectable

weighting associated therewith and wherein said antenna pattern configuration selector

selects weightings associated with the antenna devices.

11.   (Currently Amended) ~~In a~~ A method for communicating in a

communication system having a first communication station and a second

communication station between which data is communicated, data communication by the

second communication station to the first communication station effectuated upon a first

channel and data communication by the first communication channel to the second

communication station effectuated upon a second channel, the first communication

station having an antenna array capable of forming an adaptively-selectable antenna

pattern configuration, ~~an improvement of~~ said a method for selecting the antenna pattern

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configuration formed by the antenna array responsive to indications of data

communicated by the second communication station to the first communicated, said

method comprising:

generating a first-channel correlation matrix responsive to

indications of the data communicated to the first communication station, the first-channel

correlation matrix defined in terms of first Fourier series coefficients of first values;

reformulating the ~~indications of the data communicated by the~~

~~second communication station~~ first-channel correlation matrix communicated to the first

communication station into a vector ~~representation of the indications~~, the vector

representation including a coefficient vector;

calculating values of the coefficient vector of the vector

representation formed during said operation of reformulating;

calculating indications of characteristics of the second channel

responsive to the values of the coefficient vector, the indications of the characteristics of

the second channel used to select the antenna pattern configuration, the characteristics of

the second channel also defined in terms of the first Fourier series coefficients of the first

values.

12.–20.   (Cancelled)

21.   (New) Apparatus for a radio communication system having a first

communication station and a second communication station between which data is

communicated, data communication by the second communication station to the first

communication station effectuated upon a first channel and data communication by the

first communication station to the second communication station effectuated upon a

second channel, the first communication station having an antenna array capable of

forming an adaptively-selectable antenna pattern configuration, said apparatus for

selecting the antenna pattern configuration formed by the antenna array responsive to

indications of data communicated by the second communication station to the first

communication station, said apparatus comprising:

an uplink channel correlation matrix former adapted to receive

indications of incident angles at which data is communicated to the first communication

station, said channel correlation matrix representative of the uplink channel;

a downlink channel correlation matrix former adapted to receive

discrete Fourier-transformed representations of the uplink channel correlation matrix

former by said uplink channel correlation former, said downlink channel correlation

matrix former for forming a downlink correlation matrix; and

an antenna weighting value selector adapted to receive indications of

the downlink channel correlation matrix formed by said downlink channel correlation

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matrix former, said antenna weighting value selected for selecting antenna weights of

antennas of the antenna array, thereby to select the antenna pattern configuration thereof.